ACTION OF CERTAIN DRUGS UPON INTESTINAL PERISTALSIS.

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IN this paper I shall endeavor to show how certain medicinal agents act on the movements of the intestines. Nothnagel discovered that when a crystal of salt is applied to the intestinal canal there is a wave of contraction which always runs toward the pylorus. My experiments were made upon rabbits immersed in a half-per-cent. salt solution contained in a zinc trough. The temperature of the bath was 37–38° C. The animal was etherized before the operation, the anæsthetic being used subcutaneously. When the abdominal contents were bared, the salt-crystal was applied to portions of the small intestine and the reaction noted; then the drug was given and the effect on the reaction observed. In another place[1] I have tried to show that drugs may be divided into intestino-inhibitory and intestino-motor; that morphine and atropin in small doses are intestino-inhibitory, and eserin, nicotin, and muscarin intestino-motor. The first drug experimented with was chloral. Dr. Lauder Brunton was unable to observe any inhibitory action of the splanchnics after the animal was narcotized with chloral. I have narcotized several rabbits and always found the splanchnics able to arrest intestinal movements. Only in enormous doses have the splanchnics become weaker. To irritate the splanchnics, Ludwig's needle electrodes were inserted into the spinal cord and the induction-current of DuBois' instrument turned on.[1] The salt-reflex was always present in chloralized animals, and in some came on slowly. The wave of contraction was occasionally upward and downward. With aloin the salt-reflex was quite active, as were the splanchnics. A milligramme of atropin arrested the salt-reflex of aloin. With pilocarpin, the salt-reflex took place in both directions; a subsequent dose of atropin caused it to occur in one direction—toward the pylorus. The splanchnics were active.

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[1] *New York Medical Journal*, 1883.

Strychnia had no perceptible effect on the salt-reflex. When infusion of digitalis was used, a wave of contraction ran in both directions upon the application of the salt. A subsequent dose of atropin nearly arrested the salt-reflex of digitalis. With aconitin the salt-reflex was more extensive, but, contrary to the usual effect, atropin failed to arrest the salt-reflex when used subsequent to the dose of aconitin. Irritation of the splanchnics was without effect in rabbits poisoned with aconitin. Attached are some of the experiments upon which the preceding statements are based.

CHLORAL.

EXP. 1.—Rabbit, etherized; received two and a half grains of chloral subcutaneously; the salt-reflex was present; then seventeen and a half grains of chloral were injected subcutaneously; the salt-reflex was present at the end of an hour; the splanchnics were also at the same time active.

EXP. 2.—Rabbit, etherized; received subcutaneously forty grains of chloral; the salt-reaction took place very slowly and spread in both directions; irritation of the splanchnics an hour after the injection arrested peristalsis.

EXP. 3.—Rabbit, etherized; received subcutaneously forty grains of chloral; an hour after the injection, irritation of the splanchnics arrested the peristalsis, although their action was weaker.

EXP. 4.—Rabbit, received subcutaneously forty grains of chloral; irritation of the splanchnics arrested the peristalsis.

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[1] Sanderson's Hand-book, p. 525.

ALOIN.

EXP. 5.—Rabbit, etherized; received .016 gramme aloin subcutaneously; salt-reaction quite active; intestinal movements active; irritation of splanchnics arrests the peristalsis; .001 gramme atropin was given subcutaneously; salt-reflex afterward failed.

PILOCARPIN.

EXP. 6.—Rabbit, etherized; received .001 gramme of muriate of pilocarpin subcutaneously. After some time the salt caused a wave of contraction in both directions; .001 gramme of atropin subcutaneously; upon application of salt, the wave of contraction runs in only one direction—toward the pylorus.

STRYCHNIA.

EXP. 7.—Rabbit, etherized; received subcutaneously .001 gramme of strychnia. Upon application of salt I saw no effect beyond normal—even up to the period of death by convulsions.

DIGITALIS.

EXP. 8.—Rabbit, etherized; received subcutaneously thirty-two cubic centimetres of the officinal infus. digitalis. When salt was applied peristalsis ensued in both directions; .001 gramme of atropin, in an hour, nearly completely arrested the salt-reaction.

ACONITIN.

EXP. 9.—Rabbit, etherized; received subcutaneously .0008 gr. aconitin; the salt-reflex was more extensive.

EXP. 10.—Rabbit, etherized; received subcutaneously .001 gramme aconitin; the salt-reflex was more active. .001 gramme of atropin was given subcutaneously, but at the end of an hour the salt-reaction was still present.

EXP. 11.—Rabbit, etherized; received subcutaneously .001 gramme aconitin; the salt-reaction was increased; .001 gramme of atropin was given subcutaneously, but it did not affect the salt-reaction.

EXP. 12.—Rabbit, etherized; received subcutaneously .0016 gramme aconitin subcutaneously; in three hours, irritation of the splanchnics was without effect; the salt-reflex was more extensive than normal.